

## PATENT COOPERATION TREATY


PCT

REC'D 17 JAN 2006

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY<sup>PCT</sup>

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 62397A	<b>FOR FURTHER ACTION</b> See Form PCT/PEA/416	
International application No. PCT/US2004/033219	International filing date (day/month/year) 07.10.2004	Priority date (day/month/year) 16.10.2003
International Patent Classification (IPC) or national classification and IPC B01J21/06, B01J23/50, B01J23/66, C07D301/10		
Applicant UNION CARBIDE CHEMICALS & PLASTICS TECH... et al.		
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 7 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> sent to the applicant and to the International Bureau a total of 15 sheets, as follows:</p> <p><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>		
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input checked="" type="checkbox"/> Box No. VIII Certain observations on the international application</p>		
Date of submission of the demand  03.08.2005	Date of completion of this report  16.01.2006	
Name and mailing address of the international preliminary examining authority:   European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer  Gosselin, D  Telephone No. +49 89 2399-8400	



**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/US2004/033219

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**Box No. I Basis of the report**

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1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
  - ☐ publication of the international application (under Rule 12.4)
  - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements\*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):*

**Description, Pages**

1-6, 9-11, 13-16, 20, 22, 24, 25      as originally filed  
7, 8, 12, 17, 17a, 18, 18a, 19, 19a,      received on 08.08.2005 with letter of 03.08.2005  
21, 23, 26

**Claims, Numbers**

1, 4-24      received on 08.08.2005 with letter of 03.08.2005

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
  - ☐ the claims, Nos.
  - ☐ the drawings, sheets/figs
  - ☐ the sequence listing (*specify*):
  - ☐ any table(s) related to sequence listing (*specify*):
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages
  - ☐ the claims, Nos.
  - ☐ the drawings, sheets/figs
  - ☐ the sequence listing (*specify*):
  - ☐ any table(s) related to sequence listing (*specify*):

\* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/US2004/033219

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**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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**1. Statement**

Novelty (N)	Yes: Claims	8-22
	No: Claims	1-7,23,24
Inventive step (IS)	Yes: Claims	
	No: Claims	1-24
Industrial applicability (IA)	Yes: Claims	1-24
	No: Claims	

**2. Citations and explanations (Rule 70.7):**

**see separate sheet**

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**Box No. VIII Certain observations on the international application**

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The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

**see separate sheet**

**Re Item V**

**Reasoned statement with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement**

1. Reference is made to the following documents:

- D1: US-A-2 593 097 (BURT JANET T ET AL) 15 April 1952 (1952-04-15)
- D2: US-A-5 145 824 (BUFFUM JOHN E ET AL) 8 September 1992 (1992-09-08)
- D3: US-A-5 733 842 (REMUS DONALD J ET AL) 31 March 1998 (1998-03-31)
- D4: EP-A-1 308 442 (NIPPON CATALYTIC CHEM IND) 7 May 2003 (2003-05-07)
- D5: US-A-5 801 259 (KOWALESKI RUTH MARY) 1 September 1998 (1998-09-01)
- D6: EP-A-0 480 538 (UNION CARBIDE CHEM PLASTIC) 15 April 1992 (1992-04-15)
- D7: EP-A-0 393 785 (UNION CARBIDE CHEM PLASTIC) 24 October 1990 (1990-10-24)

2. The present application does not meet the requirements of Article 33(1) PCT, because the subject-matter of claims 1 to 24 is not new in the sense of Article 33(2) EPC or does not involve an inventive step in the sense of Article 33(3) PCT in view of at least D1 alone or in combination with D2 (**cf. the passages quoted in the search report**).
3. Due to the absence of limitation in the definition of claim 1 of the application with regard to the zircon content in the carrier, D1 anticipates the subject-matter of at least claims 1 to 7, 23 and 24. These claims lack novelty in view of D1.

The preferred carrier of D1 consists of "a spinel type material, corresponding to the formula  $\text{ZrO}_2 \cdot \text{SiO}_2$ " (per definition a mixed oxide), which is a zirconium silicate, and silver is deposited on said carrier (column 2, lines 41-46). The catalyst is used for the same purpose.

D1 explicitly mentioned that the "spinel type material" is the preferred form (US-A-2 593 097). A spinel is a crystalline form of formula  $\text{AB}_2\text{O}_4$ ; it is not an simple physical admixture of zirconia and silica, but a mixed oxide. It is assumed that this preferred

form is used in the example. D1 is not concerned with the preparation of the support per se. The arguments of the applicant filed with the letters of 03.08.2005 and 01.12.2005 concerning the conditions of preparations of the zircon are irrelevant.

- 3a. It is admitted that D1 does not disclose the addition of promoters according to claims 7 and 8, but the addition of such promoters is not an essential feature of the application and could be within the ambit of the skilled man in view of documents cited in the application, or D2 and some of the A-documents cited in the search report. The subject-matter of claims 7 and 8 should also not involve an inventive step in view of D1 in combination with i.a. D2.
- 3b. The remaining dependent claims do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step. At present the reasons supporting the inventive step of these claims are not apparent.

The applicant should be ready to indicate in the national or regional phase the difference of the subject-matter of the new claim vis-à-vis the state of the art and the significance thereof, i.e. the applicant should discuss the novelty and the inventive step following the problem/solution approach, or provide evidence that a technical effect, which could not be expected by a skilled man, has been obtained.

The technical problem to be defined should be defined over the disclosure of the closest prior art and further supported by the application documents as originally filed, otherwise it should be considered that the subject-matter of the application has been enlarged beyond the content of the application as originally filed (invention realised after the filing date) (Article 34(2)b) PCT). The Applicant should indicate the support for the technical problem in the application as originally filed.

4. The objections raised in view of D2 are withdrawn in view of the arguments filed by the applicant with the letters of 03.08.2005 and 01.12.2005.
5. The fact that the applicant may have identified a technical effect which is due to the presence of same zirconium silicate in the carrier does not render the subject-matter

of these claims inevitably novel.

**Re Item VIII**

**Certain observations on the international application**

**1. The claims do not meet the requirements of Article 6 and Rule 6 PCT.**

- 1a. The catalyst of claim 1 is both defined by:
- a) the final use (manufacture of alkene oxide), and by
  - b) a result to be achieved (enhancement of certain properties as compared to similar catalysts, which does not comprise zirconium).
- The presence of a) and b) does not unambiguously provide technical features, which could be considered for the examination of novelty and inventive step.

Moreover it is doubtful whether the improvement of the activity should not been measured by reference to a catalyst comprising as much zirconium (by reference to the metal) than a catalyst according to the application, but in an other chemical form than zirconium silicate (for example zirconia).

- 1b. The amendment filed by the applicant has overcome part of the discrepancy. The attention is drawn to the fact that claim 19 is based on page 8, lines 1-5, of the description. The features of claim 19 are disclosed in combination with a modified alpha-alumina carrier and the minimum purity of said alumina carrier. The purity and the nature of the support should a priori be introduced into the claim. The dependancy upon claim 1 does not seem to be consistent with the disclosure of page 8; claim 19 should be rendered dependent upon claim 18. In the present form the subject-matter of claim 19 is not supported by the application as originally filed contrary to Article 34(2)(b) PCT.
- 1c. The relative term "about" used in various claims has no well-recognised limits and leave the reader in doubt as to the meaning of the technical feature to which it refer, thereby rendering the definition of the subject-matter of said claims unclear (Article 6 PCT; Guidelines, Chapter 5, 5.38). The term should be deleted, especially when

**INTERNATIONAL PRELIMINARY  
REPORT ON PATENTABILITY  
(SEPARATE SHEET)**

International application No.

PCT/US2004/033219

used in combination with a range.